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Pfinztal, 31.3.1999

Dear Dr. Raffoul,

we are organizing an International Conference on

**„Energetic Materials “**

from June 29 to July 2, 1999 in Karlsruhe, Germany.

The main topics of this Conference will be:

- Modeling of Phenomena
- Experimental Characterization
- Environmental Engineering

We are enclosing a preliminary program of the Conference. You will see that we have 96 contributions:

14 from USA:

No. 1, 38, 85: NSWC Indian Head

No. 57-60: Naval Research Laboratory

No. 41: ARDEC, Picatinny

24 from Russia

14 from Germany,

8 from UK (GB)

6 from France

6 from China

5 from The Netherlands

2 from Spain

1 from Portugal

44 from other countries

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We also enclose an estimation of the costs of the Conference and would appreciate it if you could give us a contribution.

Sincerely yours,

A handwritten signature in cursive script, appearing to read 'F. Volk', written in black ink.

(Dr. Fred Volk)

Enclos.:

- Announcement and Call for Paper
- Preliminary program
- Estimation of the costs

### **Sources of Income for the Conference**

|  | DM       | \$       |
|--|----------|----------|
| a) Contributions by non-conference agencies  | -        | -        |
| b) Registration fees of attendees including proceedings<br>and conference literature | 240000.- | 133332.- |
| c) Special fees  | -        | -        |
| d) Conference literature: DM 150.- / exemplar  | -        | -        |
| e) Financial support from US Army  | 4000.-   | 2222.-   |
| f) Financial support requested from US Air Force                                     | 4000.-   | 2222.-   |
| g) Financial support requested from Navy   | 4000.-   | 2222.-   |
| h) The difference will be regulated by our Institute                                 | 8000.-   | 4444.-   |
|  | 260000.- | 144442.- |

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### **Estimation of the costs of the Conference**

|   | DM       | \$       |
|---|----------|----------|
| a) Rental fees for Meeting rooms                    | 78000.-  | 43333.-  |
| b) Wages / salaries of personnel                    | 26000.-  | 14444.-  |
| c) Subsidies for attendees fee of invited attendees | 35000.-  | 19444.-  |
| d) Subsidies for living quarters for attendees      | 8000.-   | 4444.-   |
| e) Subsidies for transport                          | 2000.-   | 1111.-   |
| f) Utilities, such as telephones                    | 2000.-   | 1111.-   |
| g) Mailing expenses                                 | 10000.-  | 5556.-   |
| h) Editing and publication of Call for Papers       | 5000.-   | 2778.-   |
| of final program                                    | 13000.-  | 7222.-   |
| of Proceedings                                      | 55000.-  | 30555.-  |
| i) Interpreters English-German ; German-English     | 26000.-  | 14444.-  |
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## *Preliminary program*

1.

Energetic liquid azido nitramines

R.L. Simmons,

Naval Surface Warfare Center, Indian Head, USA

2.

Numerical modelling of the dependence of impact sensitivity on the properties of explosives

A.V. Dubovik,

Semenov Institute of Chemical Physics RAS, Moscow, RUSSIA

3.

Entwicklung eines Kombi-Treib-/Sprengstoffs für den Einsatz in low-cost Unterwasserlaufkörpern

H.P. Hebekeuser, H.P. Mackowiak, R. Schöffl,

Dynamit Nobel GmbH, Burbach-Würgendorf, D

4.

Some relationships for explosion initiation in binary compositions oxidizer-fuel during the impact

V.A. Teselkin, A.V. Dubovik,

Semenov Institute of Chemical Physics RAS, Moscow, RUSSIA

5.

Effect of additives on the burning rate of solid fuel in the flow of gaseous oxygen

N.N. Bakhman,

Institute of Chemical Physics RAS, Moscow, RUSSIA

6.

Prüfmethode EMBLA zur Bestimmung der linearen Brenngeschwindigkeit von Treibladungspulver

K. Kupzik, H. Niggemeyer, T. Barski,

WIWEB, Swisttal, D

7.

Wirkungsprediction hinsichtlich von IED/USBV auf die Umgebung und Gefahrobjekte

L. Lukacs,

Militäruniversität „Zrinyi Miklos“, Budapest, H

O. Mueller,

Budapest, H

8.

Indirekte Karl-Fischer-Titration - ein neuer Weg zur Bestimmung der Feuchtigkeit in Explosivstoffen

*Indirect Karl Fischer Titration - a new method to determine the moisture content of explosives*

S. Wilker, G. Schiemann,

WIWEB, Swisttal-Heimerzheim, D

9.

The thermal decomposition of polyfunctional azidocompounds

R.S. Stepanov, L.A. Kruglyakova,  
Siberian State Technological University, Krasnoyarsk, RUSSIA

10.

A quantitative approach for the determination of the age life of a pyrotechnic material in an airbag inflator

M.W. Barnes, C. Hock,  
Autoliv ASP Inc., Ogden, USA

11.

Characterization of NTO-based pressed PBX-formulations

F.C. Fouche, H.C. Bezuidenhout, F.A. Venter,  
Naschem, RSA  
C.E. du Toit,  
Somchem, RSA

12.

Procedure for selection of molecular structures of explosives having high performance

P. Vavra,  
University of Pardubice, Pardubice, CZ

13.

Calculation of detonation heat by EXPLO5 computer code

M. Suceška,  
Brodarski Institute, Zagreb, CROATIA

14.

Physics of Nitrozoamine combustion as a monopropellant and as an ingredient of modern propellants

A.A. Zenin, S.V. Finjakov, N.G. Ibragimov,  
Semenov Institute of Chemical Physics RAS, Moscow, RUSSIA

15.

Comparison of two HTPB based composite propellants by dynamic mechanical analysis

A. Göcmez, M.Y. Özen, F. Pekel,  
Defense Industries Research and Development Institute, Ankara, TR  
S. Özkar,  
Middle East Technical University, Ankara, TR

16.

To ultrafine diamond formation mechanism under detonation synthesis and its yield dependence on external conditions

A.Y. Babushkin, A.I. Lyamkin, G.A. Chiganova,  
Krasnoyarsk State Technical University, Krasnoyarsk, RUSSIA

17.

Attractive soft-sphere equation of state

A.Y. Babushkin, A.I. Lyamkin,  
Krasnoyarsk State Technical University, Krasnoyarsk, RUSSIA

18.

Interaction of Glycidyl azide polymer plasticizer with other polymers

A.P. Manzara, R.W. Hunter,  
3M Chemicals Division, St. Paul, USA

19.

Modelling experiments of penetration into cased materials

D. Davis, W. Huntington-Thresher, A. Kosecki, P.D. Church, D.C. Mullenger,  
DERA Fort Halstead, Sevenoaks, GB

20.

Mechanical properties of a porous material studied in a high speed piston driven compaction experiment

J.F. Moxnes,  
FFI, Kjeller, N  
G. Odegardstuen,  
Nammo Raufoss AS, Raufoss, N  
A. Atwood, P. Curran,  
Naval Air Warfare Center Weapons Division, China Lake, USA

21.

Improvement of Hydrazinium Nitroformate product characteristics

M.I. Rodgers,  
ICI Nobel Enterprises, Stevenston, GB  
A.E.D.M. van der Heijden,  
TNO-PML, Rijswijk, NL  
W.H.M. Veltmans,  
Aerospace Propulsion Products bv, Bergen op Zoom, NL

22.

The ICT-Thermochemical Database

H. Bathelt, F. Volk, M. Weindel,  
Fraunhofer ICT, Pfinztal, D

23.

Triazolyl-1,2,5-oxadiazoles - a new class of energetic compounds



L.V. Batog, V.Y. Rozhkov, L.S. Konstantinova, A.N. Blinnikov, N.N. Makhova, T.S. Pivina,  
N.D. Zelinsky Institute of Organic Chemistry RAS, Moscow, RUSSIA

24.

4-amino-3-azidocarbonylfuroxan as an universal synton for the synthesis of high energetic compounds of furoxan series

N.N. Makhova, A.S. Kulikov, I.V. Ovchinnikov, T.S. Pivina,  
N.D. Zelinsky Institute of Organic Chemistry RAS, Moscow, RUSSIA

25.

Role of chain reactions at thermal decomposition of RDX in solution

Y. Shu, V.V. Dubikhin, G.M. Nazin, G.B. Manelis,  
Institute of Chemical Physics RAS, Chernogolovka, RUSSIA

26.

Ab initio study of mechanism of gas-phase monomolecular destruction of Nitroethylene

A.G. Shamov, G.M. Khrapkovskii,  
Kazan State Technological University, Kazan, RUSSIA

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Eco-friendliness in the production of high energy materials - a case study of HMX production

M.V. Rajopadhye, P.R. Hima, R.K. Syal,  
High Energy Materials Research Laboratory, Pune, IND

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Unempfindliche Anzündmischungen für moderne Treibladungen

E. Rochat,  
Oerlikon Contraves Defence Pyrotec AG, Studen, CH  
B. Berger,  
Gruppe Rüstung, Thun, CH

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Characterisation of thermal runaway reactions in energetic solid materials using accelerating rate calorimetry

P.F. Bunyan, D.A. Tod,  
DERA Fort Halstead, Sevenoaks, GB

30.

Crystal growth rate and impurity effect during RDX crystallization

J.H. ter Horst,  
Delft University of Technology, Delft, NL  
R.M. Geertman,  
Akzo Nobel Central Research, Arnhem, NL  
A.E. van der Heijden, G.M. van Rosmalen,  
TNO-PML, Rijswijk, NL

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Underwater explosion of aluminized emulsion explosives

Y. Kato, K. Takahashi, A. Torii, K. Kurokawa, H. Hattori,  
NOF Corporation, Chita-gun Aichi, JAP

32.

Determination of the detonation energy and some of the energetic characteristics of various  
NTO-based formulations

G.J. Ellis, H.C. Bezuidenhout,  
NASCHEM, Potchefstroom, RSA

33.

Kinetics of thermal decomposition of Hexanitrohexaazaisowurtzitane

B. Korsounskii, V. Nedelko, N. Chukanov, T. Larikova,  
Institute for Chemical Physics RAS, Chernogolovka, RUSSIA  
F. Volk,  
Fraunhofer ICT, Pfinztal, D

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Micro-inclusions in HMX crystals

A.E.D.M. van der Heijden, W. Duvalois, C.J.M. van der Wulp,  
TNO-PML, Rijswijk, NL

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Some peculiarities of the alkaline hydrolysis of Nitrocellulose

B. Lurie, V. Malchevski,  
Mendeleev University of Chemical Technology, Moscow, RUSSIA

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An environmentally favorable continuous process for the synthesis of BDNPA/F

R.B. Wardle, R.S. Hamilton, M. Geslin, V. Mancini, D. Merrill,  
Thiokol Propulsion, Brigham City, USA

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A fully recyclable oxetane TPE rocket propellant

R.B. Wardle, R.S. Hamilton, C. Hughes,  
Thiokol Propulsion, Brigham City, USA

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Development of tough TPE gun propellants

P.C. Braithwaite, A. Sanderson, R.B. Wardle,  
Thiokol Propulsion, Brigham City, USA  
L.E. Harris, T. Manning, K. Klingaman,  
US Army ARDEC, Picatinny Arsenal, USA  
T. Stephens,  
Naval Air Warfare Center, China Lake, USA  
S. Prickett,  
Naval Surface Warfare Center, Indian Head, USA

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A study of the laser ignition of HMX/carbon black compositions

S.G. Goveas, R.C. Drake,  
AWE plc, Aldermaston, GB

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Non-uniformity of elementary unit composition of Cellulose nitrates and ion-molecular species of nitrating mixtures

V.I. Kovalenko,  
Kazan State Technological University, Kazan, RUSSIA

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Performance and hazard characterization of CL-20 formulations

M. Mezger, S.M. Nicolich, D.A. Geiss Jr.,  
US Army TACOM-ARDEC, Picatinny Arsenal, USA  
R.L. Hatch, K.E. Lee,  
Thiokol Corporation, USA

42.

Thermodynamic modeling of detonation of hydrazine-nitromethane-methanol liquid mixtures

S.B. Victorov, S.A. Gubin, I.V. Maklashova,  
Moscow State Engineering Physics Institute, Moscow, RUSSIA

43.

End game logic of target coverage for anti tactical ballistic missile

L.-M. Chao,  
Chung Shan Institute of Science and Technology, Lung-Tan Taiwan, ROC

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Distributed activation energy model for thermal decomposition kinetics of plastic bonded explosives

T.-F. Yeh,  
Chung Cheng Institute of Technology, Taoyuan Taiwan, ROC

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Dynamisch mechanische Eigenschaften schnellbrennender rauchreduzierter Festtreibstoffe

P. Gerber, S. Eisele, K. Menke,  
Fraunhofer ICT, Pfinztal, D

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Modelling and experimental evidence of mechanical stresses and analytical determination of ferrocene migration for an end burning propellant grain

K. Menke, E. Geißler, G. Bunte,  
Fraunhofer ICT, Pfinztal, D  
H. Kentgens, R. Schöffl,  
Dynamit Nobel Explosivstoff und Systemtechnik GmbH, D

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Sensitivity and thermal analysis of MTV igniter composition

V.S. Bhingarkar, H.J. Gandhi, P.A. Phawade, H. Singh,  
High Energy Materials Research Laboratory, Pune, IND

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Results of TNT destruction by electrochemical way

M.E. Rabanal, M.A. Martinez,  
Universidad Carlos III de Madrid, Leganes, E  
A.J. Criado,  
Universidad Complutense de Madrid, Madrid, E  
N. Braojos, A. Perez de Diego,  
Laboratorio Químico Central de Armamento, San Martin de la Vega, E

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Biochemical treatment of industrial waste waters from ammonium perchlorates and chlorates

M. Gaudre, J.M. Tauzia,  
SNPE, Saint Medard en Jalles, F

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Pyrolysis and self-heating characterizations to predict the munitions responses to slow cook-off

Y. Guengant, D. Houdusse, B. Briquet,  
SNPE-CRB, Vert le Petit, F

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From gun propellant to space launchers, the challenges of internal aerodynamics at SNPE

J.F. Guery, B. Gondouin, C. Reynaud,  
SNPE-CRB, Vert le Petit, F

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Progress in determining the burning rate of a composite solid propellant using an ultrasound technique

F. Cauty, C. Erades,  
ONERA, Chatillon Cedex, F

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Azetidine and its mono-, di- and trinitro-substituted derivatives: Computer modeling of decomposition reactions

T.S. Pivina, D.E. Lushnikov,  
N.D. Zelinsky Institute of Organic Chemistry RAS, Moscow, RUSSIA  
A.A. Porollo, T.V. Petukhova, V.P. Ivshin,  
Mari State University, Yoshkar-Ola, RUSSIA

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The enthalpy of formation study of nitrate and perchlorate salts

Y.N. Matyushin, T.S. Konkova, L.M. Kostikova,

Semenov Institute of Chemical Physics RAS, Moscow, RUSSIA

T.S. Pivina,

Zelinsky Institute of Organic Chemistry RAS, Moscow, RUSSIA

V.A. Palyulin, I.I. Baskin,

Lomonosov State University, Moscow, RUSSIA

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Thermochemical properties and quantum-chemical parameters of benzofuroxans and benzofurazans derivatives

Y.N. Matyushin, V.I. Pepekin, V.P. Lebedev, V.V. Chironov, L.M. Kostikova, Y.O. Inozemtsev,  
Semenov Institute of Chemical Physics RAS, Moscow, RUSSIA

T.S. Pivina,

Zelinsky Institute of Organic Chemistry RAS, Moscow, RUSSIA

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Comparativ studying combustion of composite propellants containing ultra fine aluminum

V.N. Simonenko, V.E. Zarko,

Institute of Chemical Kinetics and Combustion, Novosibirsk, RUSSIA

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Teflon and Teflon/Al (nanocrystalline) decomposition chemistry at high pressures

L.J. Parker, H. D. Ladouceur, T.P. Russell,

Naval Research Laboratory, Washington, USA

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The laser-induced reaction chemistry and kinetics of ammonium perchlorate at static high pressures

G.I. Pangilinan, T.P. Russell,

Naval Research Laboratory, Washington, USA

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Probing the deflagration/detonation chemistry of RDX

T.P. Russell, G.I. Pangilinan, D. Ladouceur,

Naval Research Laboratory, Washington, USA

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Ionization potentials of the decomposition products of TNAZ and RDX

N.L. Garland, S.W. McElvany,

Naval Research Laboratory, Washington, USA

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DMA solid propellant properties and the assesment of the service life of a rocket motor

E. de la Cruz, G. Jenaro,

Laboratorio Quimico Central de Armamento, Madrid, E

62.

Jet formation in cavity charges

M. Held,  
TDW, Schrobenuhausen, D

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Blast-momentum of non-spherical unconfined HE-charges

M. Held, L. Chun,  
TDW, Schrobenuhausen, D

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Bulk ageing effects in double base propellant

G.M. Kavanagh, D.A. Tod, R. White,  
DERA Fort Halstead, Sevenoaks, GB

65.  
The thermodynamic rules for evaluation of ignition temperature as applied to heterogeneous pyrotechnic composition

V.V. Klyucharev,  
Institute of New Chemical Problems RAS, Chernogolovka, RUSSIA

66.  
Shock initiation studies of composite gun propellants

D.F. Debenham, A.P. Kosecki,  
DERA Fort Halstead, Sevenoaks, GB

67.  
Supersonic combustion testing with laser optical diagnostics

U. Brummund,  
DLR Lampoldshausen, Hardthausen, D  
B. Mesnier,  
Universite d'Orleans, F

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Determination of a detonation pressure from a water test

W.A. Trzcinski, S. Cudzilo, L. Szymanczyk,  
Military University of Technology, Warsaw, PL

69.  
Plasticised PolyGLYN binders for composite energetic materials

M.D. Cliff,  
DSTO, Salisbury, AUS  
A.V. Cunliffe,  
DERA Fort Halstead, Sevenoaks, GB

70.  
Characterisation of RDX and HMX surfaces using gas chromatography

S.A. Torry, A.V. Cunliffe, D. Tod,  
DERA Fort Halstead, Sevenoaks, GB

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Untersuchung von Abbrandvorgängen am System Magnesium/Teflon/Viton (MTV) durch Emissionsspektroskopie

E.-C. Koch, A. Dochnahl,  
Piepenbrock Pyrotechnik GmbH, Göllheim, D

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Study on the chemical properties of N100

Xiao An, Gan Xiao-Xian, Lu Xing-Seng,  
Xian Modern Chemistry Research Institute, Xian, PRC

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The effect of heating rate on ignition temperature of energetic materials

P. Cardao,  
University of Coimbra, Coimbra, P  
J.C. Gois, J. Campos,  
Inst. Polytechnics of Guarda, Guarda, P

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Study on ability of PPB strong igniting composition

Cheng Yi, Chen Shouwen, Wu Yajun, Zhu Hongfeng,  
Nanjing University of Science and Technology, Nanjing, PRC

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Study on burning characteristic of NFA gas generant in different diameter and thickness

Bao Guogang, Chen Shouwen, Cheng Yi,  
Nanjing University of Science and Technology, Nanjing, PRC

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ADN flame structure modeling

O.P. Korobeinichev, T.A. Bolshova, A.A. Paletsky,  
Institute of Chemical Kinetics and Combustion RAS, Novosibirsk, RUSSIA

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Gasdynamics of filling and ignition of elastic stagnation zones of large-sized solid rocket motors

A.B. Vorozhtsov, S.S. Bondarchuk,  
Tomsk State University, Tomsk, RUSSIA

78.

Rheological behaviour of a paste material

J.P. Faure, D. Picart,  
CEA, Monts, F

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Characterisation of impurities in CL20

M. Kaiser, B. Ditz,  
WIWEB, Swisttal-Heimerzheim, D

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Characterization of heat release process of energetic materials

N. Kubota,  
Mitsubishi Electric Corp., Kamakura, JAP  
I. Aoki,  
Nissan Motor Co. Ltd., JAP

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The application of computer modelling to the assessment of safety and suitability for service of munitions

I.G. Wallace,  
MOD, Bristol, GB

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Decomposition studies of production grade ammonium perchlorate and an ammonium perchlorate based solid rocket propellant

A.I. Atwood, P.O. Curran, K.J. Kraeutle, T.P. Parr, D. Hanson-Parr,  
Naval Air Warfare Center Weapons Division, China Lake, USA

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Chemical kinetics at detonation of organic compounds - nitric acid mixtures

V.M. Raikova, A. Halak, B.N. Kondrikov,  
Mendeleev University of Chemical Technology, Moscow, RUSSIA

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The failure thickness of detonation of solutions on the base of strong nitric acid

G.D. Kozak, V.M. Raikova, V.V. Potapov,  
Mendeleev University of Chemical Technology, Moscow, RUSSIA

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An analytical test of the hypothesis that low molecular weight combustion gases will facilitate achievement of hypervelocity

S.T. Peters, N. Almeyda,  
Naval Surface Warfare Center, Indian Head, USA

86.

Analysis of shock wave curvature in the water gap test

E.G. de Jong, R. Oostdam, H.J. Verbeek, R.H.B. Bouma,  
TNO PML, Rijswijk, NL

87.

The influence of the free-volume on the cook-off response

G. Scholtes, R.H.B. Bouma, J. Makkus,  
TNO PML, Rijswijk, NL



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Modellierung von Abbrandphänomenen bei porösen Ladungen  
*Modeling of combustion phenomena of porous propellants*

T.S. Fischer, W. Koppenhöfer, G. Langer,  
Fraunhofer ICT, Pfinztal, D

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Modellierung der Matrix-Füllstoffablösung von energetischen Materialien mit der Methode der  
Finiten Elemente

E. Geißler, C. Hübner,  
Fraunhofer ICT, Pfinztal, D

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The effect of silicane coupling agent on TATB based PBX

Ji Guangfu, Luo Shunhuo,  
Institute of Chemical Materials CAEP, Chengdu, CHINA

91.

Evaluation of PBXs viscoelastic properties and aging behavior by DMA

Hao Ying, Li Jingming,  
Institute of Chemical Materials CAEP, Chengdu, CHINA

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The effect of copper catalyst in double-base and nitro-amine modified propellant

Wang Jiang-Ning, Wang Bai-Cheng, Zhang Rui-E, Wang Bao-Xiang,  
Xian Modern Chemistry Research Institute, Xian, CHINA

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Direkte Kreuzkorrelation zur hochauflösenden PIV-Auswertung von Wirbelstrukturen  
*Direct cross correlation for high resolution PIV of vortex structures*

A. Brock, L. Deimling,  
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94.

Modellierung und Simulation der Leistungsdaten, des Abbrandproduktspektrums, der  
optimalen Formulierung, der chemischen Stabilität und Kompatibilität, der thermochemischen  
Reaktionen und des Alterungsverhaltens in der Produktentwicklung von energetischen  
Materialien

*Modelling and simulation of the performance data, of the burning product composition, of the  
optimum formulation, of the chemical stability and compatibility, of the thermochemical  
reactions, and of the ageing behaviour of energetic materials during their development*

M.A. Bohn,  
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95.

Relationship between the longest N-N bond lengths and activation energies of low-temperature  
thermolysis of nitramines